

CLAIMS

1. An emission amount notifying device comprising:

detecting means (40) for detecting an emission amount of a predetermined
5 substance emitted from a vehicle;

converting means (22) for converting the emission amount detected by the
detecting means to a number of unit(s); and

notifying means (42) for notifying of the number of unit(s) obtained by the
conversion.

10 2. An emission amount notifying device comprising:

detecting means (40) for detecting an emission amount of a predetermined
substance emitted from a vehicle;

calculating means (22) for calculating the emission amount corresponding to a
15 difference between the emission amount detected by the detecting means and a standard
value; and

notifying means (42) for notifying of the calculated emission value.

3. An emission amount notifying device comprising:

20 detecting means (40) for detecting an emission amount of a predetermined
substance emitted from a vehicle;

storing portion (26) for storing an amount of money corresponding, in advance,
to the emission amount;

obtaining means (22) for obtaining from the storing portion the amount of
25 money corresponding to the emission amount detected by the detecting means; and

notifying means (42) for notifying of the obtained amount of money.

4. The emission amount notifying device according to claim 1, 2 or 3, wherein

said notifying means includes a display device (42).

5 5. The emission amount notifying device according to claim 1, 2 or 3, wherein
said predetermined substance includes one or more of a carbon dioxide, nitrogen
oxides, sulphur oxides and hydrocarbons.

6. The emission amount notifying device according to claim 1, 2 or 3, further
comprising:
 sending means (30) for sending information related to the emission amount
10 detected by said detecting means.

7. An emission charging system for a vehicle comprising:
 an engine operation state detecting means (114) for detecting stop/drive of an
engine on the vehicle;
15 wireless communication means (122) mounted on said vehicle and connected to
a communication network; and
 a management unit (115) connected to said communication network, and
charging for emissions of said vehicle, wherein
 said management unit performs the charging according to an amount of the
20 emissions of said vehicle based on engine drive information provided from said engine
operation state detecting means.

8. The emission charging system for the vehicle according to claim 7, wherein
 said vehicle is provided with run/stop detecting means (113), and said system
25 calculates an idling duration, an amount of the emissions corresponding to the idling
duration and an amount of a charge for the amount of the emissions from said vehicle-
stop information provided from said run/stop detecting means and said engine drive
information.

9. The emission charging system for the vehicle according to claim 8, wherein said run/stop detecting means (113) includes at least one of a vehicle speed sensor, a GPS (Global Positioning System) and an acceleration sensor.

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10. The emission charging system for the vehicle according to claim 7, wherein conditions for setting an amount of the charge include an engine displacement, vehicle position information and/or an ambient temperature at the vehicle position.

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11. The emission charging system for the vehicle according to claim 10, wherein

said ambient temperature at said vehicle position is determined by temperature detecting means (126) on said vehicle, or is determined from global temperature information based on the vehicle position information provided from said GPS.

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12. The emission charging system for the vehicle according to claim 11, wherein

warning about a failure is sent to a driver of said vehicle when the failure occurs in any one of said engine operation state detecting means, said wireless communication means, said run/stop detecting means and said temperature detecting means mounted on said vehicle.

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13. The emission charging system for the vehicle according to claim 7, wherein said vehicle includes display means (224), and

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said management unit sends an amount of money to be charged to said vehicle via said communication network and said wireless communication means to said vehicle, and said display means displays the charged amount of money.

14. The emission charging system for the vehicle according to claim 7, wherein said charged amount of money is deducted from an account managed by a manager of said vehicle.

5 15. An vehicle emission charging system comprising:
a vehicle-mounted device (212) having idling detecting means (229) for detecting an idling state of a vehicle, and wireless communication means (222) connected to a communication network;
a management unit (215) receiving the idling information obtained by said
10 vehicle-mounted device over said communication network, and charging for emissions of the vehicle; and
a mobile inspection device (230) performing communication with said vehicle-mounted device over said communication network, and checking a normal operation of the vehicle-mounted device, wherein
15 said inspection device sends a vehicle ID to said management unit over said communication network, said management unit sends a connection ID for communication with said vehicle-mounted device to said inspection device based on the received vehicle ID, and said inspection device checks the normal operation of said vehicle-mounted device by establishing the communication with said vehicle-mounted
20 device based on said connection ID.

16. An emission charging system for a vehicle comprising:
a vehicle-mounted device (212) having idling detecting means (229) for detecting an idling state of a vehicle, wireless communication means (212) connected to
25 a communication network, and short-range wireless communication means (223) not connected to the communication network;
a management unit (215) receiving the idling information obtained by said vehicle-mounted device over said communication network, and charging for emissions

of the vehicle; and

an inspection device (230) communicated with said vehicle-mounted device by short-range wireless communication, and checking a normal operation of said vehicle-mounted device, wherein

5 said inspection device checks a normal operation of said vehicle-mounted device by performing the short-range wireless communication to communicate directly with said vehicle-mounted device located within a communication-allowed area from the vehicle.

10 17. The emission charging system for the vehicle according to claim 15 or 16, wherein

penalties such as a fine and/or reduction of license points are imposed on a manager of the vehicle when said inspection device (230) determines an abnormal operation of said vehicle-mounted device (212).

15 18. The emission charging system for the vehicle according to claim 15 or 16, wherein

said vehicle includes display means (224), and

20 an amount of money charged to said vehicle is sent from said management unit (215) to said vehicle over said communication network, and said display means displays the charged amount of money.

19. The emission charging system according to claim 18, wherein

25 said charged amount of money is deducted automatically from a bank account designated by a manager of said vehicle, and, if the deduction is impossible due to an insufficient balance of the account, the management unit provides a notification to said vehicle-mounted device over said communication network to display warning by said display means.

20. The emission charging system for the vehicle according to claim 19,
wherein

an extra charge is imposed when payment is impossible due to the insufficient
5 balance of said account.

21. The emission charging system for the vehicle according to claim 15 or 16,
wherein

said idling detecting means (229) includes engine operation state detecting
10 means (214) for detecting stop/drive of an engine, and run/stop detecting means (213)
for detecting a stop state of the vehicle, and

said idling detecting means (229) recognizes the idling state from engine drive
information provided from said engine operation state detecting means and vehicle-stop
information provided from said run/stop detecting means.

22. A management unit (115) capable of communication with a vehicle-
mounted device (112) on a vehicle, comprising:

receiving means (S21) for receiving times of start and stop of idling of said
vehicle from said vehicle-mounted device;

20 calculating means (S24) for calculating an amount of emissions during idling
from said received idling start time and said received idling stop time, and calculating an
amount of a charge corresponding to said amount of the emissions; and

sending means (S26) for sending the calculated amount of the charge to said
vehicle-mounted device.

23. The management unit according to claim 22, further comprising:

obtaining means (S23) for sending the idling start time and the idling stop time to
a server of a weather information center, and obtaining information about temperature

change in a corresponding time zone, wherein

said calculating means determines a unit charge from the obtained temperature change information and a displacement of the vehicle.

5 24. The management unit according to claim 22, wherein
said management unit further sends an instruction to a server of a banking organ to deduct said charged amount from an account of an owner of said vehicle (S25).

10 25. An inspection device comprising:
input means for inputting a vehicle ID;
sending means (S140) for sending said input vehicle ID to a management unit charging for emissions of a vehicle;
receiving means (S141) for receiving from said management unit a connection ID for communication with a vehicle-mounted device mounted on said vehicle in
15 response to sending of said vehicle ID;
communication establishing means (S142) for establishing the communication with said vehicle-mounted device by using the received connection ID; and
determining means (S143) for checking a normal operation of said vehicle-mounted device by determining whether said communication establishing means
20 established the communication or not.

 26. A management unit comprising:
first receiving means (S120) for receiving a vehicle ID, an idling start time and an idling end time from a vehicle-mounted device mounted on a vehicle;
25 calculating means (S122) for calculating an amount of emissions during an idling duration from the received idling start time and the received idling stop time, and calculating an amount of a charge corresponding to the amount of the emissions;
a database (218) storing a log of the received idling start time, the received idling

end time and the calculated amount of the charge for each of the received vehicle IDs;
second receiving means (S201) for receiving the vehicle ID, the idling start time
and the idling end time of said vehicle from an inspection device capable of
communication with said vehicle-mounted device; and

5 determining means (S203, S204) for determining whether said database has
stored the log of the idling start time and the idling end time of the vehicle ID received
from said inspection device or not.

27. The management unit according to claim 26, further comprising:
10 determination result sending means (S205, S206) for sending results of the
determination performed by said determining means to said inspection device.